CLEAN: To what extent do US consumers follow techniques for washing fresh produce that are associated with favorable food safety outcomes?

Conclusion

Moderate, consistent evidence shows that US consumers are not following recommended produce washing techniques at home.

Grade

Moderate

Evidence Summary Overview

A total of two cross-sectional studies that both received neutral quality ratings were reviewed regarding the extent to which US consumers follow techniques for washing fresh produce that are associated with favorable food safety outcomes.

Dharod et al, (2007a) found that among Puerto Rican home meal preparers, 87% washed the lettuce and 85% washed the tomatoes under running water while preparing salad. In their direct observation study among 99 US college students. Anderson et al, (2004) found that six did not clean any of the vegetables used to prepare a salad, 70 rinsed the lettuce, 93 rinsed the tomato, 47 rinsed the carrots and 55 rinsed the cucumber with water. This study also documented that average washing time ranged from 4.8 to 12.4 seconds, substantially shorter than the time recommended by the author of 60 seconds. These findings indicate that washing practices can vary significantly for different vegetables and that these behaviors need to be substantially improved.

Evidence Summary Paragraphs

Anderson et al, 2004 (neutral quality), a cross-sectional study, compared consumer food-handling behaviors with the FightBAC! consumer food-safety recommendations. A total of 99 subjects (92 women and seven men) were randomly recruited by telephone and videotaped in their home while preparing a meal. Videotapes were coded according to Fight BAC! recommendations, a food safety survey was administered and temperature data was collected. Key findings in terms of cleaning vegetables included: Six subjects made no attempt to clean any of the vegetables that were used to prepare the salad, 70 subjects rinsed the lettuce, 93 rinsed the tomato, 47 rinsed the carrots and 55 rinsed the cucumber with water. Overall, subjects did not follow the Fight BAC! recommendations for safe food handling.

Dharod et al, 2007a (neutral quality), a cross-sectional study, assessed the magnitude of differences between self-reported and observed food safety practices among 60 Puerto Rican women recruited in inner city Hartford, Connecticut. Three home visits were conducted over four days: first (day one), delivery of food ingredients for preparation of chicken breast (CB)/salad meal; second (day three), household observations; third (day four), closed-end self-report food safety interview survey. Accuracy of self-report was calculated as follows: (Desirable self-reported food safety behaviors confirmed through direct observation) + (undesirable behaviors observed and then acknowledged through self-report) / total sample. The following behaviors were observed (percent of subjects) in preparing fresh lettuce and tomatoes for consumption: 62% washed lettuce in colander after cutting it, 25% washed whole head of lettuce in water and 13% did not wash the lettuce. Twenty-five percent washed tomatoes in colander after cutting, 60% washed whole tomatoes in water and 15% did not wash tomatoes. Accuracy of self-reported food safety behaviors was high for washing lettuce and tomatoes. Investigators conclude that over-reporting errors must be considered when interpreting data derived from self-reported food safety consumer surveys.

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Author, Year, Study Design, Class, Rating	Population/Sample Description and Location	Design/Variables	Results/Behavioral Outcomes/Significance	Limitations
Anderson J, Shuster T et al, 2004 Study Design: Cross-sectional study Class: D Rating:	Initial N: 92 women, seven men Final N: 99. Predominately white (percentage was not reported); middle-class residents from a county that consists of a small urban area surrounded by rural communities. Location: United States.	**Design:** Observational study (participants were videotaped while preparing a single entree and salad) and self-report food handling survey (included questions about the observed food preparation session, perceptions about food safety and foodborne illness risk, final cooking temperatures, hand washing, surface cleaning and food storage). Temperature of cooked meat entree data was collected. **Dependent variables:** Observed food safety behaviors of subjects (e.g., vegetable cleaning). **Independent variables:** FightBAC! consumer food safety recommendations (e.g., relating to Clean (hand washing, surface cleaning, vegetable cleaning), among others related to Separate; Cook; and Chill.	Findings regarding cleaning vegetables included: • Six subjects made no attempt to clean any of the vegetables that were used to prepare the salad • 70 rinsed the lettuce • 93 rinsed the tomato • 47 rinsed the carrots • 55 rinsed the cucumber with water.	Authors indicated that participants' food safety knowledge and attitude data from the food safety survey collected during the study did not correspond with their observed behaviors, and survey data showed participants know more about food safety than their behavior demonstrated. Participants were recruited under the pretense of market research for food preparation practices in an effort to eliminate bias for food safety research.

Dharod JM, Perez-Escamilla R et al, 2007a Study Design: Cross-sectional study Class: D Rating:	N=60 Puerto Rican women recruited from inner city Hartford, CT. Mean age: 40 years. 60% spoke only Spanish at home; 55% had less than a high school education; 85% were unemployed; 56.7% had a monthly income of less than $1,000. Location: United States.	Microbial testing, household observation and self-report interview survey. **Dependent variables:** Thawing method, use and sanitation of cutting boards and knives, hand washing habits, washing of produce, method of checking chicken doneness; participants were asked to cook the chicken and salad meal using only the ingredients provided. A closed-end questionnaire was developed to measure self-reported behaviors.	The following behaviors were observed (% subjects) in preparing fresh lettuce and tomatoes for consumption: • 62% washed lettuce in colander after cutting it • 25% washed whole head of lettuce in water • 13% did not wash the lettuce • 25% washed tomatoes in colander after cutting • 60% washed whole tomatoes in water • 15% did not wash tomatoes. Accuracy of self-reported food safety behaviors was high for washing lettuce and tomatoes.	A convenient sample was used; observation could influence practice; no description provided for the validation of the interview survey used. Investigators conclude that over-reporting errors must be considered when interpreting data derived from self-reported food safety consumer surveys.

Research Design and Implementation
For a summary of the Research Design and Implementation results, click here.

Worksheets

Anderson JB, Shuster TA, Hansen KE, Levy AS, Volk A. A camera's view of consumer food-handling behaviors. J Am Diet Assoc. 2004; 104: 186-191.

Dharod JM, Pérez-Escamilla R, Paciello S, Bermúdez-Millán A, Venkitanarayanan K, Damio G. Comparison between self-reported and observed food handling behaviors among Latinas. J Food Prot. 2007; 70: 1,927-1,932.